

IN THE CLAIMS:

1 1. (Currently Amended) An alternating current type surface-discharge plasma
2 display panel comprising a facing pair of substrates and a plurality of ribs interposed between the
3 substrates so as to form a plurality of spaces,

4 the plurality of spaces being provided with a phosphor layer and filled with
5 discharge gas, so as to form a plurality of discharge spaces;

6 inside each of the discharge spaces, plural pairs of display electrodes covered by a
7 dielectric layer being provided, the dielectric layer is made of two different sets of material,

8 the plasma display panel performing displaying by the following steps: 1) writing
9 by an accumulation of electric charge in the dielectric layer, 2) applying a predetermined
10 sustaining voltage between the pairs of display electrodes, 3) glow-discharging in selected
11 discharge spaces in which the electric charge has been accumulated in the dielectric layer, and 4)
12 converting ultraviolet light resulting from the glow-discharge into visible light by means of the
13 phosphor layer,

14 wherein the dielectric layer is made by laminating ~~at least the~~ two different
15 dielectric materials,

16 and wherein a- the panel structure is set such that an equivalent electric field
17 strength of 37V/cm • Pa or more is generated in the selected discharge spaces, when the
18 predetermined sustaining voltage is applied.

1 2. (Original) The plasma display panel of Claim 1,

2 wherein the discharge gas contains xenon, and the ultraviolet light contains more
3 amount of xenon molecular line than an amount of xenon resonance) line on the spectrum.

1 3. (Currently Amended) An alternating current type surface-discharge plasma
2 display panel comprising a facing pair of substrates and a plurality of ribs interposed between the
3 substrates so as to form a plurality of spaces,

4 the plurality of spaces being provided with a phosphor layer and filled with
5 discharge gas, so as to form a plurality of discharge spaces,

6 inside each of the discharge spaces, plural pairs of display electrodes are covered
7 by a dielectric layer, ~~being provided~~ the dielectric layer is made of two different sets of material,

8 the plasma display panel performing displaying by the following steps: 1) writing
9 by an accumulation of electric charge in the dielectric layer, 2) applying a predetermined
10 sustaining voltage between the pairs of display electrodes, 3) glow-discharging in selected
11 discharge spaces in which the electric charge has been accumulated in the dielectric layer, and 4)
12 converting ultraviolet light resulting from the glow-discharge into visible light by means of the
13 phosphor layer,

14 wherein an amount of xenon contained in the discharge gas and filling pressure of
15 the discharge gas, a gap between the display electrodes, and a thickness and a permittivity of the
16 dielectric layer are set so that an equivalent electric field strength of 37V/cm • Pa or more is
17 generated in the selected discharge spaces, when the predetermined sustaining voltage is applied.

1 4. (Original) The plasma display panel of Claim 3,

2 wherein xenon contained in the discharge gas is in a range of 5% to 90 %
3 inclusive.

1 5. (Original) The plasma display panel of Claim 4,
2 wherein the filling pressure of the discharge gas is in a range of 66.5KPa to
3 200KPa inclusive.

1 6. (Currently Amended) The plasma display panel of Claim 3,
2 wherein the thickness of the dielectric layer is in a range of 3 μm to 5 μm
3 inclusive, at a point where ~~a-~~ the pair of the display electrodes are opposing each other.

1 7. (Currently Amended) The plasma display panel of Claim 6,
2 wherein the dielectric constant of the dielectric layer is 6 or more and less than 9.

1 8. (Cancelled)

1 9. (Previously Presented) The plasma display panel of Claim 3,
2 wherein the distance between the pairs of display electrodes is in a range of
3 20 μm to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

1 10. (Currently Amended) An alternating current type surface-discharge plasma
2 display panel comprising a first plate and a second plate disposed parallel to each other, with a
3 plurality of ribs interposed between the two plates so as to form a plurality of spaces,
4 the first plate having, on an inner surface, plural pairs of display electrodes
5 covered by a dielectric layer, the dielectric layer is made of two different sets of material,
6 the second plate having, on an inner surface, a plurality of address electrodes,
7 the first plate and the second plate being disposed in such a manner that the
8 display electrodes cross over the address electrodes,

9 each of the plurality of ribs being interposed between adjacent address electrodes,
10 and

11 each of the plurality of spaces being provided with a phosphor layer and filled
12 with discharge gas, so as to form discharge spaces,

13 the plasma display panel performing displaying the following steps: 1)
14 accumulating electric charge in the dielectric layer by performing writing-discharge between the
15 display electrodes and the address electrodes, 2) applying a predetermined sustaining voltage
16 between the pairs of display electrodes, 3) glow-discharging in selected discharge spaces in
17 which the electric charge has been accumulated in the dielectric layer, and 4) converting
18 ultraviolet light resulting from the glow-discharge into visible light by means of the phosphor
19 layer,

20 wherein ~~a-~~ the panel structure is set such that an equivalent electric field strength
21 of 37V/cm • Pa or more is generated in the selected discharge spaces, when the predetermined
22 sustaining voltage is applied.

1 11. (Currently Amended) An alternating current type surface-discharge plasma
2 display panel comprising a first plate and a second plate disposed parallel to each other, with a
3 plurality of ribs interposed between the two plates so as to form a plurality of spaces,

4 the first plate having, on an inner surface, plural pairs of display electrodes
5 covered by a dielectric layer, the dielectric layer is made of two different sets of material,

6 the second plate having, on an inner surface, a plurality of address electrodes,

7 the first plate and the second plate being disposed in such a manner that the
8 display electrodes cross over the address electrodes,

9 each of the plurality of ribs being interposed between adjacent address electrodes,

10 and

11 each of the plurality of spaces being provided with a phosphor layer and filled
12 with discharge gas, so as to form discharge spaces,

13 the plasma display panel performing displaying by the following steps: 1)
14 accumulating electric charge in the dielectric layer by performing writing-discharge between the
15 display electrodes and the address electrodes, 2) applying a predetermined sustaining voltage
16 between the pairs of display electrodes, 3) glow-discharging in selected discharge spaces in
17 which the electric charge has been accumulated in the dielectric layer, and 4) converting
18 ultraviolet light resulting from the glow-discharge into visible light by means of the phosphor
19 layer,

20 wherein an amount of xenon contained in the discharge gas and filling pressure of
21 the discharge gas, a gap between the display electrodes, and the thickness and a permittivity of
22 the dielectric layer are set so that an equivalent electric field strength of 37V/cm • Pa or more is
23 generated in the selected discharge spaces, when the predetermined sustaining voltage is applied.

1 12-16. (Cancelled)

1 17. (Previously Presented) The plasma display panel of Claim 11,

2 wherein the distance between the pair of display electrodes is in a range of 20 μm
3 to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

1 18-25. (Cancelled)

1 26. (Previously Presented) A display unit comprising the alternating current type
2 surface-discharge plasma display panel of Claim 1, and a driving circuit for applying voltage to
3 every electrode included in the plasma display panel.

1 27. (Previously Presented) The plasma display panel of Claim 4,
2 wherein the distance between the pairs of display electrodes is in a range of
3 20 μ m to 90 μ m inclusive, where the display electrodes are facing the discharge spaces.

1 28. (Previously Presented) The plasma display panel of Claim 5,
2 wherein the distance between the pairs of display electrodes is in a range of
3 20 μ m to 90 μ m inclusive, where the display electrodes are facing the discharge spaces.

1 29. (Previously Presented) The plasma display panel of Claim 6,
2 wherein the distance between the pairs of display electrodes is in a range of
3 20 μ m to 90 μ m inclusive, where the display electrodes are facing the discharge spaces.

1 30. (Previously Presented) The plasma display panel of Claim 7,
2 wherein the distance between the pairs of display electrodes is in a range of
3 20 μ m to 90 μ m inclusive, where the display electrodes are facing the discharge spaces.

1 31. (Previously Presented) The plasma display panel of Claim 12,
2 wherein the distance between the pair of display electrodes is in a range of 20 μ m
3 to 90 μ m inclusive, where the display electrodes are facing the discharge spaces.

1 32. (Previously Presented) The plasma display panel of Claim 13,
2 wherein the distance between the pair of display electrodes is in a range of 20 μm
3 to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

1 33. (Previously Presented) The plasma display panel of Claim 14,
2 wherein the distance between the pair of display electrodes is in a range of 20 μm
3 to 90 μm inclusive, where the display electrodes are facing the discharge spaces.

1 34-39. (Cancelled)

1 40. (Previously Presented) The plasma display panel of Claim 17,
2 wherein forms of a pair of the display electrodes differ from each other.

1 41. (Previously Presented) The plasma display panel of Claim 17,
2 wherein at least one of pair of the display electrodes has protrusions extending
3 toward the other display electrode.

1 42. (Cancelled)

1 43. (Currently Amended) The plasma display panel of Claim 17,
2 wherein the display electrodes are metal electrodes and the permittivity dielectric
3 constant of the dielectric layer is 6 or more than 9 or less.

1 44. (Cancelled)

1 45. (Previously Presented) The plasma display panel of Claim 17,
2 wherein the display electrodes are made by stacking bus lines on transparent
3 electrodes, and the dielectric layer is thicker on the bus lines than on the transparent electrodes.

1 46. (Cancelled)

1 47. (Previously Presented) A display unit comprising the alternating current type
2 surface-discharge plasma display panel of Claim 2, and a driving circuit for applying voltage to
3 each electrode included in the plasma display panel.

1 48. (Previously Presented) A display unit comprising the alternating current type
2 surface-discharge plasma display panel of Claim 3, and a driving circuit for applying voltage to
3 each electrode included in the plasma display panel.

1 49. (Previously Presented) A display unit comprising the alternating current type
2 surface-discharge plasma display panel of Claim 10, and a driving circuit for applying voltage to
3 each electrode included in the plasma display panel.

1 50. (Previously Presented) A display unit comprising the alternating current type
2 surface-discharge plasma display panel of Claim 11, and a driving circuit for applying voltage to
3 each electrode included in the plasma display panel.

1 51. (New) An alternating current type surface-discharge plasma display panel
2 comprising a facing pair of substrates and a plurality of ribs interposed between the substrates so
3 as to form a plurality of spaces,

4 the plurality of spaces being provided with a phosphor layer and filled with
5 discharge gas including Xenon, so as to form a plurality of discharge spaces;

6 inside each of the discharge spaces, plural pairs of display electrodes are covered
7 by a dielectric layer;

8 the plasma display panel providing a display by: 1) writing by an accumulation of
9 electric charge in the dielectric layer, 2) applying a predetermined sustaining voltage between the
10 pairs of display electrodes, 3) glow-discharging in selected discharge spaces in which the electric
11 charge has been accumulated in the dielectric layer, and 4) converting ultraviolet light resulting
12 from the glow-discharge into visible light by means of the phosphor layer,

13 wherein the dielectric layer is made by laminating at least two different dielectric
14 materials,

15 and wherein a ratio of Xe excimer exceeds that of a Xe resonance line in the
16 ultraviolet light when a predetermined sustaining voltage is applied.

1 52. (New) The alternating current type surface-discharge plasma display panel of
2 Claim 51 wherein a first dielectric material covers the display electrodes and a second dielectric
3 material covers only a portion of the display electrodes.

1 53. (New) The alternating current type surface-discharge plasma display panel of
2 Claim 51 wherein

3 a first dielectric material is ZnO-B₂O₃-SO₂-K₂O-CuO and a second dielectric
4 material is ZnO-B₂O₃-SiO₂-K₂O.

1 54. (New) The alternating current type surface-discharge plasma display panel of
2 Claim 51 wherein

3 one dielectric material has a dielectric constant within a range of 6-7 and the other
4 dielectric material has a dielectric constant within a range of 11-13.

1 55. (New) The alternating current type surface-discharge plasma panel of Claim 51
2 wherein one dielectric material is a PbO glass and the other dielectric material is a ZnO glass.

1 56. (New) The alternating current type surface-discharge plasma panel of Claim 51
2 wherein one dielectric material has a higher softening temperature than the other dielectric
3 material.